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Remarks

Claims 1-21 were pending in the application. Claims 1-17 were rejected. Claims 18-21 were withdrawn. No claims were merely objected to and no claims were allowed. By the foregoing amendment, no claims are canceled, claims 1 and 12 are amended, and claims 22-24 are added. No new matter is presented.

Restriction was required as follows:

- I. Claims 1-17, drawn to apparatus, classified in class 416, subclass 198A.
- II. Claims 18-21, drawn to method, classified in class 416, subclass 198A.

Applicants affirm the election of Group I with traverse. Traverse is on the grounds that examination of all the claims would not present an undue burden. Although separately classified, the search classes of the two groups are expected to largely, if not completely, overlap. Accordingly, if the restriction requirement is withdrawn, claims 1-21 will be examined. If not withdrawn, claims 1-17 will be examined.

The Specification

The specification has been amended as helpfully suggested in the Office action.

Claim Rejections-35 U.S.C. 102

Claims 1, 4, 6, 12, 13, and 15 were rejected as being anticipated by Burge (US Patent No. 6,267,553). Applicants respectfully traverse the rejection.

At the paragraph numbered nine of the Office action, Burge's "low-pressure (LP) shaft 104" was cited as the shaft of present independent claims 1 and 12. Burge col. 6, lines 11 and 12. Elements 62-70 were cited as the claimed disks. However, these are of "the high-pressure compressor (HPC) rotor..." Col. 10, line 5. Thus, the identified Burge shaft does not "rotate about an axis with the plurality of disks and the plurality of spacers" as is specified in claim 1. The rotation as a unit has been further clarified. Support for this is found in the fourth sentence of paragraph 0010 of the present pre-grant publication (0008 of the as-filed application). Burge further fails to suggest such a configuration. Thus, independent claims 1 and 12 and their

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dependent claims are clearly patentable over Burge.

Applicants further note that there is no clear teaching in Burge for the interference fit of claim 4.

Claims Rejections-35 U.S.C. 103

Claim 2 was rejected under 35 U.S.C 103(a) as being unpatentable over Burge.

Applicants respectfully traverse the rejection.

Claim 2 is patentable over Burge as noted above relative to claim 1.

Claims 1, 3, 5, 7-12, 15, 16, and 17 were rejected under 35 U.S.C 103(a) as being unpatentable over Naudet (US Patent No. 4,844,694) in view of Burge. Applicants respectfully traverse the rejection.

It was asserted as obvious "to modify the spacer of Naudet by using an outwardly concave spacer and interference fittings, as taught by Burge in order to reduce the radial strain and bending stress of the spacers." Office action, last sentence of paragraph number 12. First, no support has been cited for this proposed motivation. Second, there is no suggestion why one, if seeking to modify Naudet based upon Burge, would only adopt the concavity and not also adopt the bore (i.e., elements 72 and 74 of Burge). This is clearly supported by Burge itself. Compare the prior art FIG. 1 of Burge to FIG. 2 of Burge. It is seen that the concavity of Burge is provided to accommodate the vane underplatform seals or shrouds (see elements 46, 48, and 50 of FIG. 1 and contrast with elements 128 and 130 of FIG. 3 of Burge). If anything, Burge's teaching of adding bores is even more clear (see FIG. 11 of Burge adding a bore without concavity). Clearly, the Burge teaching of bores does not suggest the subject matter of independent claim 8 and its dependent claims.

No specific element of Naudet was identified as being the claimed shaft of independent claims 1 and 12. FIG. 1 of Naudet shows, in phantom lines, a bore tube which serves to block air passage but essentially does not transmit torque and force (this can easily be seen by the illustrated O-ring engagement between the bore tube and elements 3 and 4 of Naudet). Thus, this bore tube within the rotor stack is not the claimed shaft. Additionally, claims 1 and 12 have been amended to distinguish any actual shaft existing only beyond the rotor stack. Specifically, the

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shaft is identified as "passing through" the plurality of disks. Support for this is found in the second sentence of paragraph 0029 of the pre-grant publication (0027 of the as-filed application). Thus, even if there were reason to attempt a combination of Naudet and Burge, it would not yield the invention of independent claims 1 and 12 and their dependent claims.


Claim 14 was rejected under 35 U.S.C. 103(a) as being unpatentable over Naudet in view of Burge as applied to claim 12 and further in view of the engineering expedient of modifying the precompression force "based on the specific size of the rotor stack..." Applicants respectfully traverse the rejection.

The rejection is believed overcome for the same reasons as the underlying rejection of claim 12. Furthermore, in the absence of a center tie shaft, there is no suggestion in Naudet for precompression or other compressive force optimization.

The added claims 22-24 relate the stack compression (and specifically precompression) to shaft tension (and specifically pretension). Support for claims 22-24 is found in the third from last sentence of paragraph 0038 of the pre-grant publication (0036 of the as-filed application). It is understood that operational forces (e.g., thrust) may cause the two forces to depart from equal magnitude. Naudet does not suggest the claimed combination of disk stack compression and shaft tension.

Accordingly, Applicant submits that claims 1-24 are in condition for allowance. Please charge any fees or deficiency or credit any overpayment to our Deposit Account of record.

Respectfully submitted,

By 

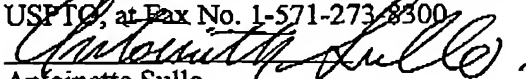
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I hereby certify that this correspondence is being faxed this 27th day of October, 2005 to the USPTO, at Fax No. 1-571-273-8300.


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